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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,804

08/02/2006

Bertram Kopperger

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6033

21553 7590 08/19/2010
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EXAMINER

THOMPSON, CAMIE S

ART UNIT

PAPER NUMBER

1786

MAIL DATE

DELIVERY MODE

08/19/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,804	Applicant(s) KOPPERGER ET AL.	
	Examiner Camie S. Thompson	Art Unit 1786	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on AfterFinal Response filed 7/28/2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16 and 18-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16 and 18-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Examiner truly regrets the untimely reopening of prosecution and early indication of allowable subject matter.
2. Examiner acknowledges amended claim 18.
3. The rejection of claims 18 and 19 under 35 U.S.C. 112, second paragraph is overcome by applicant's amendment.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 16, 18-30 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Labib et al., U.S. Patent Number 5,426,000.

Labib discloses composites comprising multi-layered coatings applied by reactive sputtering of a titanium target (as per instant claims 20-21 and 32-35) providing an initial deposition of pure titanium onto a silicon carbide fiber (as per instant claims 23-25) and then gradual introducing nitrogen/argon gas mixture for a co-deposition of titanium and titanium nitride until stoichiometric amounts of titanium and nitrogen are present as per instant claims 16-28 (see column 3, lines 11-27). The Labib reference does not specifically disclose that the atoms from the reactive gas and the atoms from the titanium coating are embedded into the titanium coating that is present on the fibers. However, Labib does disclose a process in which the fibers

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are first coated with titanium via a titanium target and then a reactive gas (nitrogen/argon gas mixture) is introduced with a co-deposition of titanium and titanium nitride. The process provided by Labib would provide for the reaction of the nitrogen atoms from the gas to react with the titanium of the coating to be embedded as particles in the base layer coat of titanium on the silicon carbide fibers. Although Labib does not disclose consolidating the coated fibers, Labib does disclose that the titanium nitride coated fibers are used in composites. Therefore, it would have been obvious to one of ordinary skill in the art to have the fibers consolidated in a desired geometry in order to form composites that have high tensile strength and improved resistance to degradation.

Labib does not disclose the size of the ceramic particles that are formed and embedded in the coating from the method as per instant claims 29-30. However, this is an optimizable feature. The size of the ceramic particles embedded in the coating affect the tensile strength of the composite. Discovery of optimum values of a result effective variable involves only routine skill in the art *in re Boesch*, 617 F.2d 272,205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to have the ceramic particles have a size that is in the range of below 5 microns in order to have a composite that is resistant to thermal cracking due to the excellent bonding strength within the titanium layer because of the embedded ceramic particles.

6. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Labib et al., U.S. Patent Number 5,426,000 in view of Storer, U.S. Patent Number 5,413,851.

Labib discloses composites comprising multi-layered coatings applied by reactive sputtering of a titanium target providing an initial deposition of pure titanium onto a silicon

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carbide fiber and then gradual introducing nitrogen/argon gas mixture for a co-deposition of titanium and titanium nitride until stoichiometric amounts of titanium and nitrogen are present (see column 3, lines 11-27). The Labib reference does not specifically disclose that the atoms from the reactive gas and the atoms from the titanium coating are embedded into the titanium coating that is present on the fibers. However, Labib does disclose a process in which the fibers are first coated with titanium via a titanium target and then a reactive gas (nitrogen/argon gas mixture) is introduced with a co-deposition of titanium and titanium nitride. The process provided by Labib would provide for the reaction of the nitrogen atoms from the gas to react with the titanium of the coating to be embedded as particles in the base layer coat of titanium on the silicon carbide fibers. Although Labib does not disclose consolidating the coated fibers, Labib does disclose that the titanium nitride coated fibers are used in composites. Therefore, it would have been obvious to one of ordinary skill in the art to have the fibers consolidated in a desired geometry in order to form composites that have high tensile strength and improved resistance to degradation.

Labib does not disclose a cooling step and adjusting a cooling rate during coating. Storer discloses fibers coated with titanium under a reactive gas, nitrogen, to produce a TiN coating on fibers (see Example 5). In the claims of Storer, it is disclosed that the fibers can be silicon carbide. Storer discloses that the fibers are coated using sputtering. Examples 1 and 8 disclose that the fibers are cooled after the coating step. The cooling step allows for the composite to be formed in its desired geometry. Therefore, it would have been obvious to one of ordinary skill in the art to cool the coated fibers in order to obtain the structural geometry for the desired composite.

Response to Arguments

7. Applicant's arguments with respect to the present claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Camie S. Thompson whose telephone number is 571-272-1530. The examiner can normally be reached on Monday-Friday 8:00 am - 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer A Chriss/
Primary Examiner, Art Unit 1786

/Camie S Thompson/
Examiner, Art Unit 1786